FACTS ON FILE

EMSP

Environmental Management Science Program

Project Highlights

The Environmental Management Science Program (EMSP) is funding basic research projects focused on solving the most difficult problems that threaten the closure plans of DOE sites. This fact sheet highlights just one.

High-Fluence Neutron Source for Nondestructive Characterization of Nuclear Waste

This project is developing a higher flux (by about a factor of 1,000 than the current design) neutron source for nondestructive assay of containerized transuranic (TRU) waste at DOE sites. This new source will be based on the inertial electrostatically confined (IEC) plasma device. The essential features of the IEC plasma source are high neutron flux, long lifetime, and an option for pulsed or steady-state operation mode, compared to only pulsed mode for existing sources. Some of the applications for DOE are the characterization of TRU wastes for the Waste Isolation Pilot Plant (WIPP), the measurement of residues prior to stabilization and disposal, the measurement of cemented or vitrified wastes, the measurement of spent nuclear fuel, and the measurement of high level wastes.

Location: Los Alamos National Laboratory

Year of Award: 1996

Amount of Award: $745,139

Office of Environmental Management (EM) Problem Area: Mixed Waste

Office of Science (SC) Scientific Category/Sub-Category: Analytical Chemistry and Instrumentation/Sensors and Techniques

Research Value/Impact: IEC research has been conducted for over three decades, but always with a single grid. All previous attempts have suffered from high density, marginal neutron output, and limited lifetime because of neutral particle sputtering. All of these effects are due to the high plasma density. The Los Alamos design has already shown it can achieve lower densities.

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More Information on the Web:
http://www.em.doe.gov/science or
http://www.id.doe.gov/emsystems/emsp